UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/699,435	10/31/2000	Atsushi Murashima	Q61542	5795

7590 07/19/2004

SUGHRUE, MION, ZINN, MACPEAK & SEAS
2100 Pennsylvania Avenue, N. W.
Washington, DC 20037-3202

EXAMINER	
WOZNIAK, JAMES S	
ART UNIT	**PAPER NUMBER**
2655	9

DATE MAILED: 07/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/699,435	MURASHIMA, ATSUSHI
	Examiner	Art Unit
	James S. Wozniak	2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 5/17/2004.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-48 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) 41-46 is/are allowed.

6)☒ Claim(s) 1-40, 47, 48 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 10/31/2000 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 6.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Detailed Action

Response to Amendment

1. In response to the office action from 2/17/2004, the applicant has submitted an amendment, filed 5/17/2004, amending the specification and claims without adding new matter and adding independent claims 47 and 48, while arguing to traverse the art rejection based on the limitation regarding gain smoothing and limiting *(Amendment, Pages 31 and 33, respectively)*. Applicant's arguments have been fully considered, however the previous rejection is maintained due to the reasons listed below in the response to arguments and altered only to incorporate added claims 47 and 48.

2. Based on the amendments to the specification and claims, the examiner has withdrawn the previous objections directed towards minor informalities.

Response to Arguments

3. Applicant's arguments have been fully considered but they are not persuasive for the following reasons:

- With respect to independent **claims 1-3, 15-17, 27-29, 47, and 48**, the applicant argues that Gao *(U.S. Patent: 6,507,814)* does not teach smoothing the gain using a past gain value *(Amendment, Page 31)*, however the smoothing means shown by

Gao (Fig. 4, Element) would inherently require the use of past values in order to determine that a present gain value does not greatly differ from previous values in order to implement gain smoothing. Therefore, the use of past values is inherent in gain smoothing.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies *(i.e., the detailed process of smoothing, Amendment, Page 31)* are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Furthermore, the applicant's argument that Gao does not teach or suggest how gain smoothing is related to speech decoding *(Amendment, Page 32)*, however Gao discloses that the speech decoder shown in Fig. 5, and applied to Claim 1 in the previous office action, has the corresponding functionality of Fig. 4, which contains the gain smoothing means noted above *(Col. 6, Lines 65-67)*. Thus, Gao teaches decoding a speech signal that has been smoothed and limited *(gain limiting as taught by Jarvinen, U.S. Patent: 5,960,389)*.

The applicant also argues that Jarvinen does not teach the step of limiting the gain *(Amendment, Pages 32-33)*, however Jarvinen recites that if a gain should differ too greatly from a median threshold gain value, it is replaced by a lesser value median gain, which is a functional equivalent of gain limiting *(Col. 10, Lines 15-48)* since if the gain exceeds a threshold it is reduced through gain

replacement. Therefore, Jarvinen anticipates the claimed step of gain limiting, since no specifics regarding its detailed process are recited in the present claims.

Therefore the rejection of claims 1-3, 15-17, 27-29, 47, and 48 is maintained.

- **Claims 4-14, 18-26, and 30-40** are argued as being dependent upon independent claims. Thus, since the independent claim rejections are maintained, these claims also remain rejected.

Claim Objections

4. **Claims 1 and 48** are objected to because of the following informalities:

- With respect to **Claim 1**, "caculated" should be corrected to read --calculated--.
- With respect to **Claim 48**, "a first stop" should be corrected to read --a first step--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 1-40, 47, and 48** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gao *(U.S. Patent: 6,507,814)* in view of Jarvinen et al *(U.S. Patent: 5,960,389)*.

With respect to **Claims 1, 15, and 27**, Gao discloses:

A speech signal decoding method, apparatus, and computer program *(decoder featuring program and data ROM, Col. 40, Lines 1-6)* for decoding information concerning at least a sound source signal, gain and linear prediction coefficients from a received signal, generating an excitation signal and linear prediction coefficients from decoded information, and driving a filter, which is constituted by the linear prediction coefficients, by the excitation signal to thereby decode a speech signal, comprising:

A first step of smoothing the gain using a past value of the gain *(Fig. 4, Element 403)*;

A third step of decoding the speech signal using the smoothed gain *(reproduced speech signal, Fig. 5, Element 539)*.

Gao does not specifically teach the limiting of a smoothed gain based on a fluctuation amount from the gain and smoothed gain, however Jarvinen discloses:

A second step of limiting the value of the smoothed gain based upon an amount of fluctuation calculated from the gain and the smoothed gain *(comparing the difference between an excitation gain and an excitation gain median to a threshold and replacing a gain value exceeding the threshold, Col. 10, Lines 21-26)*.

Gao and Jarvinen are analogous art because they are from a similar field of endeavor in speech analysis through synthesis. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to combine the method and device for limiting excitation gain in relation to exceeding a threshold as taught by Jarvinen with the speech decoder featuring

gain smoothing to decode a speech signal as taught by Gao to prevent amplification of a random noise spike within a speech signal that would prove undesirable to the listener upon synthesis. It also would have been obvious to one of ordinary skill in the art, at the time of invention, to replace the median value used in threshold comparison as taught by Jarvinen with the average or smoothed value as taught by Gao, since both values with fall would fall within a middle range of a set of gain values and thus would be appropriate as gain replacement values so as not to exceed a threshold. Therefore, it would have been obvious to combine Jarvinen and Gao for the benefit of obtaining a speech decoder capable of limiting gain so as to prevent amplification of a random noise impulse, to obtain the invention as specified in Claims 1 and 15.

With respect to **Claims 2 and 28**, Gao discloses:

A speech signal decoding method, apparatus, and computer program *(decoder featuring program and data ROM, Col. 40, Lines 1-6)* for decoding information concerning at least a sound source signal, gain and linear prediction coefficients from a received signal, generating an excitation signal and linear prediction coefficients from decoded information, and driving a filter, which is constituted by the linear prediction coefficients, by the excitation signal to thereby decode a speech signal, comprising:

Deriving a norm of the excitation signal at regular intervals *(selection of an excitation signal from a codebook and an associated gain which normalizes the excitation signal, Col. 5, Lines 57-60)*;

Smoothing the norm using a past value of the norm *(Fig. 4, Element 403. Also, it would have been obvious to one of ordinary skill in the art, at the time of the invention, that an averaging (smoothing) operation would include past values in order to smooth the gain over*

time to prevent excessive gain that would prove undesirable to the listener upon speech synthesis.);

Changing the amplitude of the excitation signal in said intervals using said norm and the norm that has been smoothed *(smoothed gain applied to an excitation signal, Col. 6, Lines 45-55)*; and

Driving the filter with the excitation signal, the amplitude of which has been changed *(excitation signal driving a synthesis filter, Col. 7, Lines 26-28, and Fig. 5, Element 531).*

Gao does not teach limiting the value of the smoothed norm based upon an amount of fluctuation calculated from the norm and the smoothed norm, however Jarvinen recites:

Limiting the value of the smoothed norm based upon an amount of fluctuation calculated from the norm and the smoothed norm *(comparing the difference between an excitation gain and an excitation gain median to a threshold and replacing a gain value exceeding the threshold, Col. 10, Lines 21-26)*;

Gao and Jarvinen are analogous art because they are from a similar field of endeavor in speech analysis through synthesis. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to combine the method and device for limiting excitation gain (norm) in relation to exceeding a threshold as taught by Jarvinen with the speech decoder featuring gain smoothing to decode a speech signal as taught by Gao to prevent amplification of a random noise spike within a speech signal that would prove undesirable to the listener upon synthesis. It also would have been obvious to one of ordinary skill in the art, at the time of invention, to replace the median value used in threshold comparison as taught by Jarvinen with the average or smoothed value as taught by Gao, since both values would fall within a middle

range of a set of gain values and thus would be appropriate as gain replacement values so as not to exceed a threshold. Therefore, it would have been obvious to combine Jarvinen and Gao for the benefit of obtaining a speech decoder capable of limiting gain (norm) so as to prevent amplification of a random noise impulse, to obtain the invention as specified in Claims 2 and 28.

With respect to **Claims 3 and 29**, Gao teaches the decoding method, apparatus and computer program involving excitation signal smoothing and limiting as applied to Claims 2 and 28. Also, Gao further discloses:

A first step of identifying a "voiced" (speech) segment and a noise segment with regard to the received signal using the decoded information *(classifying noise, voiced, and unvoiced speech for appropriate modeling of input speech information, Col. 4, Lines 23-30, for use in the speech decoding process as applied to Claim 2).*

Gao does not teach limiting the value of the smoothed norm based upon an amount of fluctuation calculated from the norm and the smoothed norm, however Jarvinen recites:

Limiting the value of the smoothed norm based upon an amount of fluctuation calculated from the norm and the smoothed norm *(comparing the difference between an excitation gain and an excitation gain median to a threshold and replacing a gain value exceeding the threshold, Col. 10, Lines 21-26)*;

Gao and Jarvinen are analogous art because they are from a similar field of endeavor in speech analysis through synthesis. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to combine the method and device for limiting excitation gain (norm) in relation to exceeding a threshold as taught by Jarvinen with the speech decoder featuring gain smoothing to decode a speech or noise signal as taught by Gao to prevent

amplification of a random noise spike that would prove undesirable to the listener upon synthesis. It also would have been obvious to one of ordinary skill in the art, at the time of invention, to replace the median value used in threshold comparison as taught by Jarvinen with the average or smoothed value as taught by Gao, since both values would fall within a middle range of a set of gain values and thus would be appropriate as gain replacement values so as not to exceed a threshold. Therefore, it would have been obvious to combine Jarvinen and Gao for the benefit of obtaining a speech decoder capable of limiting gain (norm) so as to prevent amplification of a random noise impulse, to obtain the invention as specified in Claims 3 and 28.

With respect to **Claims 4, 18, and 30**, Jarvinen further discloses the method and apparatus for gain limitation as applied to Claims 1 and 15, in which the gain cannot exceed a predetermined threshold due to its replacement with an averaged excitation gain *(comparing the difference between an excitation gain and an averaged excitation gain to a threshold and replacing a gain value exceeding the threshold, Col. 10, Lines 21-26)*. It also would have been obvious to one of ordinary skill in the art, at the time of invention, to utilize the gain-normalized absolute value of the difference to determine the relative "percent" by which a threshold is exceeded in regards to a lower limit and upper limit, because exceeding a lower threshold requires going below a threshold, yielding in a negative result, while the opposite is true for an upper threshold and a percentage threshold tracks the logarithmic properties of the loudness as heard by the human ear. Thus, in order to determine the absolute amount by which a threshold has been exceeded, it would have been obvious to one of ordinary skill in the art, at the time of invention, to implement an absolute value of the percent difference in the gain limiting process.

With respect to **Claims 5 and 31**, Gao does not teach a fluctuation amount calculation for fluctuation limitation represented by dividing an absolute value of a difference between the norm and the smoothed norm by the norm, but Jarvinen further discloses:

The amount of fluctuation is represented by dividing an absolute value of a difference between the norm and the smoothed norm by the norm, and the value of the smoothed norm is limited in such a manner that the amount of fluctuation will not exceed a predetermined threshold value *(comparing the difference between an excitation gain (norm) and an excitation gain (norm) median to a threshold and replacing a gain value exceeding the threshold, Col. 10, Lines 21-26)*;

Also, it would have been obvious to one of ordinary skill in the art, at the time of invention, to utilize the normalized absolute value of the difference to determine the amount by which a percentage threshold is exceeded in regards to a lower limit and upper limit, because exceeding a lower threshold requires going below a threshold, yielding in a negative result, while the opposite is true for an upper threshold and a percentage threshold tracks the logarithmic properties of the loudness as heard by the human ear. Thus, in order to determine the absolute amount by which a threshold has been exceeded, it would have been obvious to one of ordinary skill in the art, at the time of invention, to implement such a normalized absolute value of the difference between an original and smoothed norm in the gain limiting process.

With respect to **Claims 6 and 32**, Gao does not teach a fluctuation amount calculation for fluctuation limitation represented by dividing an absolute value of a difference between the norm and the smoothed norm by the norm, but Jarvinen further discloses the decoder featuring the gain fluctuation limitation method as applied to Claims 5 and 31, above.

With respect to **Claims 7 and 33**, Gao further discloses:

The excitation signal in said intervals is divided by the norm in said intervals and the quotient is multiplied by the smoothed norm in said intervals to thereby change the amplitude of the excitation signal *(selection of an excitation signal from a codebook and an associated gain which normalizes the excitation signal, Col. 5, Lines 57-60, and smoothed gain applied to an excitation signal, Col. 6, Lines 45-55).*

With respect to **Claim 8 and 34**, Gao further discloses the excitation signal scaling method as discussed for Claims 7 and 33, above.

With respect to **Claims 9, 21, and 35**, Gao discloses the decoding method and apparatus utilizing gain smoothing and scaling as applied to Claims 1, 15, and 27. Gao does not teach switching between a scaled and original gain signal by utilizing a control signal, however Jarvinen discloses:

Switching between use of the gain and use of the smoothed gain is performed in accordance with an entered switching control signal when the speech signal is decoded *(selector, Fig. 4, Element 307, for switching between a gain and replacement gain values to implement the gain replacement method as applied to Claim 1 Col. 10, Lines 37-47).*

Gao and Jarvinen are analogous art because they are from a similar field of endeavor in speech analysis through synthesis. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to combine the ability to switch between an original and scaled excitation signal through the use of a control signal as taught by Jarvinen with the decoding method and apparatus utilizing gain smoothing and scaling as taught by Gao in order to provide appropriate system response of an original norm in the event of a noise spike and a

scaled norm in response to a valid speech signal. Therefore, it would have been obvious to combine Jarvinen and Gao for the benefit of obtaining a speech decoder capable of selecting an appropriate excitation-scaling configuration through switching means to prevent undesirable auditory outputs, to obtain the invention as specified in Claims 9, 21, and 35.

With respect to **Claims 10 and 36**, Gao discloses the decoding method and apparatus utilizing norm smoothing and scaling as applied to Claim 2. Gao does not teach switching between a scaled and original excitation signal by utilizing a control signal, however Jarvinen discloses:

Switching between use of the excitation signal and use of the excitation signal the amplitude of which has been changed is performed in accordance with an entered switching control signal when the speech signal is decoded *(selecting between excitation vectors controlled by a threshold block, Col. 11, Lines 44-54)*.

Gao and Jarvinen are analogous art because they are from a similar field of endeavor in speech analysis through synthesis. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to combine the ability to switch between an original and scaled excitation signal through the use of a control signal as taught by Jarvinen with the decoding method and apparatus utilizing excitation signal smoothing and scaling as taught by Gao in order to provide appropriate system response of an original norm in the event of a noise spike and a scaled norm in response to a valid speech signal. Therefore, it would have been obvious to combine Jarvinen and Gao for the benefit of obtaining a speech decoder capable of selecting an appropriate excitation-scaling configuration through switching means to prevent undesirable auditory outputs, to obtain the invention as specified in Claims 10 and 36.

With respect to **Claims 11 and 37**, Gao in view of Jarvinen disclose the decoder featuring norm smoothing and limiting and a switching means to select an original or scaled excitation as applied to Claims 10 and 36.

With respect to **Claims 12, 24, and 38**, Gao adds:

Encoding an input speech signal by expressing the input speech signal by an excitation signal and linear prediction coefficients *(encoder using excitation vectors and LPCs, Col. 5, Line 64- Col. 6, Line 3)*.

With respect to **Claims 13 and 39**, Gao further discloses:

Encoding an input speech signal by expressing the input speech signal by an excitation signal and linear prediction coefficients *(Col. 5, Lines 64- Col. 6, Line 4)*.

With respect to **Claims 14 and 40**, Gao further discloses encoding method as applied to Claims 13 and 39.

Claims 16 and 17 recite similar subject matter to Claims 2 and 3, respectively and thus are rejected for the same reasons.

Claims 19 and 22 recite similar subject matter to Claims 5 and 10, respectively and thus are rejected for the same reasons.

Claims 20 and 23 recite similar subject matter to Claims 6 and 11, respectively and thus are rejected for the same reasons.

Claim 25 recites similar subject matter to Claim 13, and thus is rejected for the same reasons.

Claim 26 recites similar subject matter to Claim 14, and thus is rejected for the same reasons.

Claim 47 contains subject matter similar to Claim 1, and thus, is rejected for the same reasons.

Claim 48 contains subject matter similar to Claim 2, and thus, is rejected for the same reasons.

Allowable Subject Matter

7. **Claims 41-46** are allowed.

8. The following is an examiner's statement of reasons for allowance. Prior art does not teach, nor fairly suggest:

- A smoothing coefficient calculation circuit that calculates an LSP average in combination with a decoder apparatus containing an LSP conversion circuit, gain smoothing circuitry which utilizes the LSP average, and a smoothing quantity limiter, with respect to **Claim 41**.

Claims 42-46 are allowable as they further limit their parent claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (703) 305-8669 and email is James.Wozniak@uspto.gov. The examiner can normally be reached on Mondays-Fridays, 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis Ivars Smits can be reached at (703) 306-3011. The fax/phone number for the Technology Center 2600 where this application is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology center receptionist whose telephone number is (703) 306-0377.

James S. Wozniak
7/8/2004

W. R. YOUNG
PRIMARY EXAMINER